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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/895,163	07/02/2001	Hae-Kyoung Kim	249/268	9534

27849 7590 07/31/2003

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EXAMINER

PEZZUTO, HELEN LEE

ART UNIT	PAPER NUMBER
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1713

DATE MAILED: 07/31/2003

8

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/895,163

Applicant(s)

KIM, HAE-KYOUNG

Examiner

Helen L. Pezzuto

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 07 July 2003.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-18 is/are pending in the application.
- 4a) Of the above claim(s) 1-6 and 13-18 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 7,8 and 10-12 is/are rejected.
- 7) ☒ Claim(s) 9 is/are objected to.
- 8) ☒ Claim(s) 1-18 are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 02 July 2001 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 3, 4.
- 4) ☐ Interview Summary (PTO-413) Paper No(s). _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____.

DETAILED ACTION

Election/Restrictions

1. Applicant's election of Group II, claims 7-12 in Paper No. 7 on 7/7/03 is acknowledged. Because applicant did not distinctly and specifically point out the supposed errors in the restriction requirement, the election has been treated as an election without traverse (MPEP § 818.03(a)).

The requirement is still deemed proper and is therefore made FINAL.

2. Claims 1-6, and 13-18 are withdrawn from further consideration pursuant to 37 CFR 1.142(b) as being drawn to a nonelected inventions, there being no allowable generic or linking claim. Election was made **without** traverse in Paper No. 7.

Claim Rejections - 35 USC § 102

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless -

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

4. Claims 7-8 are rejected under 35 U.S.C. 102(b) as being anticipated by WO 96/40798 or D'Agostino et al. (US-303) or

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Wodzki et al. (Angewandte Makromolekulare Chemie) or Ryzhov et al. (Plasticheskie Massy).

WO-798 discloses a copolymer composition suitably used as membrane material, comprising trifluorostyrene, substituted trifluorostyrene and substituted ethylene. In prior art copolymer embodiments, the trifluorostyrene can be substituted with SO_3H (i.e. $\text{X}=\text{SO}_3\text{H}$), and Y can be CO_2R^1 , wherein R^1 can be alkyls or perfluoroalkyls. Accordingly, the instant copolymer as defined by formula (1) falls within the scope of prior art copolymer.

US 4,012,303 to D'Agostino et al. discloses a membrane material comprising a graft copolymer of trifluorostyrene sulfonic acid and tetrafluoroethylene-hexafluoropropylene. Prior art graft copolymer reads on the instant copolymer as defined by formula (1) when r, p, and q are zero, R_1 , R_2 , and R_3 is F, X is trifluoromethyl, m and n is at least 1. Thus, anticipating the instant claims.

Wodzki et al. discloses studies on the permselectivity of ion exchange membranes. Prior art MRF membrane is produced by grafting trifluorostyrenesulfonic acid onto copolymer of hexafluoropropylene and vinylidene fluoride. Similarly, prior art hexafluoropropylene unit embraces the instant n unit as discussed in the preceding paragraph.

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Similarly, the article from Ryzhov et al. discloses a trifluorostyrene-based membrane prepared by sulfonation of hexafluoropropylene-vinylidene fluoride or hexafluoropropylene-tetrafluoroethylene copolymers with styrene (I) or trifluorostyrene (II). Prior art membrane embodiment prepared from sulfonated trifluorostyrene grafted hexafluoropropylene copolymers encompasses the instant polymer membrane represented by formula (I) as discussed above. Thus, anticipating the instant claims.

Claim Rejections - 35 USC § 103

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

6. Claims 10-12 are rejected under 35 U.S.C. 103(a) as being unpatentable over WO 96/40798 as applicable to claims 7-8 above and further in view of the following.

As discussed in 102 rejection above, prior art copolymer membrane anticipates the instant copolymer membrane when $r=1$, p and q are zero and X is

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trifluoromethyl (i.e. perfluoroalkyl). Prior art further suggest introducing crosslinking into the copolymer so as to enhance mechanical and physical properties, using conventional crosslinking agent such as divinylbenzene (page 18, lines 8-22), which meets the terms of claims 11-12. Prior art is silent regarding the weight average molecular weight of the polymer membrane. The examiner is of the position that being silent, prior art polymer membrane is generic to any molecular weight suitable for a membrane material, inclusive of applicants. In any event, it would have been obvious to one skilled in the membrane art to determine the optimum molecular weight because it has been held that where the general conditions of a claim are disclosed in the prior art, discovering the optimum or workable ranges involves only routine skill in the art.

Allowable Subject Matter

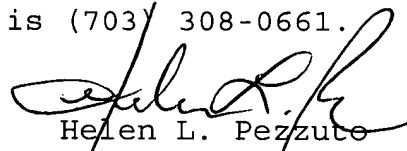
7. Claim 9 is objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims. The polymer membrane species (2)-(5) as expressed in claim 9 are allowable over prior art of record in the absence of motivation to formulate the specific units in the prior art references.

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Any inquiry concerning this communication or earlier communications from the examiner should be directed to Helen L. Pezzuto whose telephone number is (703) 308-2393. The examiner can normally be reached on 8 AM to 4 PM, Monday thru Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David Wu can be reached on (703) 308-2450. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 872-9310 for regular communications and (703) 892-9311 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0661.


Helen L. Pezzuto
Primary Examiner
Art Unit 1713

hlp
July 27, 2003